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Over 750 biomarkers identified as potentials for early cancer screening test

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Researchers have identified 788 biomarkers in blood that could be used to develop an early stage cancer screening test for the general population.

The study, led by the University of Sheffield, is the first to create a comprehensive list of relevant cancer blood biomarkers that have been researched in the last five years. The study also groups them by molecular function and records the technologies that can be used to detect them.

The team – from the Universities of Sheffield, Coventry and Warwick – started with over 19,000 scientific studies published over the last five years that investigated blood based biomarkers. Systematic review methods – including ruling out studies in fewer than 50 patients – reduced this to 4,000 studies from which the final biomarker list was compiled.

Lead researcher, Dr Lesley Uttley, from the University of Sheffield's School of Health and Related Research, said: "Because of the sheer number of publications in this field, previous reviews have only been able to look at one biomarker or a small group of biomarkers. Our data mining approach allowed us to take in all relevant research findings from the five-year period, which meant we could map the full range of potential blood-based biomarkers that are particularly relevant for early detection of cancer."

The work was carried out on behalf of the Early Cancer Detection

Consortium, a group of nearly 40 organisations, including universities, hospitals and commercial companies. The Consortium was funded by Cancer Research UK to investigate whether a cost-effective screening test can be used in the general population to identify people with early stage cancers.

The next step will be to look in detail at the research behind each biomarker, to check that it is robust and that the biomarker could feasibly be used as part of a screening test. Biomarkers will also be grouped by cancer type at this stage. The validated biomarkers will then be put through a clinical study, using samples from cancer patients and healthy controls, to check how effectively they identify the presence of cancer.

Finally, those biomarkers which work successfully in the study will be taken forward into a clinical trial, to see if the screening test works in practice and is cost-effective.

ECDC Director and Molecular Pathologist at University Hospitals Coventry and Warwickshire NHS Trust, Professor Ian Cree, said: "Our expectation is that, once the validation and clinical studies are completed, we will have a suite of around 50 biomarkers, identified using four different tests, that can go into the clinical trial. To complete the validation and the trials will take six to eight years, but in theory, we could have a test ready within three years for use in high risk groups".

"Our vision is that the screen will pick up even the small amounts of these biomarkers that might be in the blood at an early stage of the cancer, without necessarily identifying which cancer they relate to. Patients would then be referred for more specific tests, that could narrow down the tumour type."

More information: Lesley Uttley et al. Building the Evidence Base of

Blood-Based Biomarkers for Early Detection of Cancer: A Rapid Systematic Mapping Review, *EBioMedicine* (2016). DOI: 10.1016/j.ebiom.2016.07.004